

WHAT IS CLAIMED IS:

- 1                   1.       A voltage controlled oscillator comprising:  
2                   a first VCO element having an output;  
3                   a second VCO element having an input and an output, the input coupled to the  
4 output of the first VCO element;  
5                   a first gated circuit having an input and an output, the input coupled to the output  
6 of the first VCO element;  
7                   a second gated circuit having an input and an output, the input coupled to the  
8 output of the second VCO element; and  
9                   a first logic circuit configured to receive a VCO enable signal, the output of the  
10 first VCO element, and the output of the second VCO element, and further configured to provide  
11 a first output enable signal to the first gated circuit and a second output enable signal to the  
12 second gated circuit.
- 1                   2.       The voltage controlled oscillator of claim 1 wherein the first logic circuit  
2 retimes the VCO enable signal with a signal at the output of the first VCO element to provide the  
3 first output enable signal.
- 1                   3.       The voltage controlled oscillator of claim 2 wherein the first logic circuit  
2 retimes the VCO enable signal using a register.
- 1                   4.       The voltage controlled oscillator of claim 2 wherein the first logic circuit  
2 retimes the first output enable signal with a signal at the output of the second VCO element to  
3 provide the second output enable signal.
- 1                   5.       The voltage controlled oscillator of claim 4 wherein the first logic circuit  
2 retimes the first output enable signal using a register.
- 1                   6.       The voltage controlled oscillator of claim 5 wherein the first logic circuit  
2 retimes the first output enable signal using a latch.

1                   7.     The voltage controlled oscillator of claim 2 wherein the output of the first  
2 gated circuit couples to a first counter and the output of the second gated circuit coupled to the  
3 second gated counter.

1                   8.     The voltage controlled oscillator of claim 2 wherein the first VCO element  
2 and the second VCO element form a portion of a ring oscillator.

1                   9.     The voltage controlled oscillator of claim 2 wherein the output of the first  
2 VCO element is buffered by a first buffer and the output of the second VCO element is buffered  
3 by a second buffer.

1                   10.    The voltage controlled oscillator of claim 2 wherein the voltage controlled  
2 oscillator is formed on an integrated circuit.

1                   11.    The voltage controlled oscillator of claim 10 wherein the VCO enable  
2 signal is generated following an increase in a supply voltage for the integrated circuit.

1                   12.    The voltage controlled oscillator of claim 2 wherein the VCO enable  
2 signal is a reset signal that resets a counter.

1                   13.    A method of enabling outputs of a voltage controlled oscillator  
2 comprising:  
3                   receiving a VCO enable signal;  
4                   receiving a first VCO output signal;  
5                   receiving a second VCO output signal, the second VCO output signal phase  
6 shifted from the first VCO output signal; and  
7                   retiming the VCO enable signal with the first VCO output signal to generate a  
8 first VCO output enable signal.

1                   14.    The method of claim 13 further comprising:  
2                   retiming the first VCO output enable signal with the second VCO output signal to  
3 generate a second VCO output enable signal.

1                   15.     The method of claim 13 wherein when the first VCO output enable signal  
2 is asserted, the first VCO output signal is received by a logic circuit.

1                   16.     The method of claim 15 wherein the logic circuit is a counter.

1                   17.     The method of claim 15 wherein the logic circuit is a first-in-first-out  
2 memory.

1                   18.     A voltage controlled oscillator comprising:  
2                   means for generating a plurality of clock outputs including a first clock output and  
3 a second clock output, the first and second clock outputs shifted in phase relative to each other;  
4                   means for gating the first clock output and the second clock output;  
5                   means for receiving a VCO enable signal; and  
6                   means for retiming the VCO enable signal to the first clock output to generate a  
7 first gating signal,  
8                   wherein the first gating signal controls the means for gating the first clock output.

1                   19.     The voltage controlled oscillator of claim 18 further comprising:  
2                   means for retiming the first gating signal using the second clock output to  
3 generate a second gating signal,  
4                   wherein the second gating signal controls the means for gating the second clock  
5 output.

1                   20.     The voltage controlled oscillator of claim 19 further comprising:  
2                   means for counting pulses of the gated first clock output to generate a first counter  
3 output.